

GNG 2101

Design Project User and Product Manual

Submitted by:

AccessBridge B 3.4

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List of Acronyms and Glossary

Provide a list of acronyms and associated literal translations used within the document. List the acronyms in alphabetical order using a tabular format as depicted below.

Table 1. Acronyms

Acronym	Definition
API	Application Programming Interface
CSV	Comma-Separated Values
LMS	Learning Management System
PDF	Portable Document Format
RAM	Random-Access Memory
UI	User Interface

Provide clear and concise definitions for terms used in this document that may be unfamiliar to readers of the document. Terms are to be listed in alphabetical order.

Table 2. Glossary

Term	Acronym	Definition
Firewall	N/a	program that protects a network by controlling traffic and applying security policies.
User Interface	UI	The point of human-computer interaction and communication in a device.

1 Introduction

The Following will provide a comprehensive guide to the use of AccessBridge, and its creation. It will focus on sections including (in order) product overview, information on getting started, how to use the system, troubleshooting, product documentation, and conclusion. This will provide users with the knowledge of how to use AccessBridge, as well as information about the product, like how it was made and the purpose of key features.

Some of the assumptions made for this product revolve around the user themselves. Though AccessBridge is easy to use, some assumptions for the user include access to Canvas courseware, access to Blackboard Ally (to obtain .CSV file), means to edit PDF and other files to fix issues, and a means to use the tool (internet, reliable device). The user is also assumed to have at least some technical ability, primarily uploading and fixing files.

The scope of this document includes detailed steps on how to use AccessBridge (for beginners), potential concerns or issues with the tool, optimization for users, and some background info about the product. The intended audience includes but is not limited to a) people who will use this tool as an accessibility tool for course content, and b) people who wish to gain knowledge on the development of this product.

This document should not be used as a guide to copy the design of AccessBridge, but rather as a means to understand the creation and proper use of this tool.

2 Overview

The problem that AccessBridge aims to solve is improving the ease of use of an existing product, Blackboard Ally. Technically, AccessBridge is its own tool, however, the goal was to make a similar tool but making several key improvements. These included a simpler User Interface, implementing simple step-by-step instructions for the user, and ensuring that the tool is overall easy to use, even for the least tech-savvy individuals. Some other key improvements were desired, however not all of them could be achieved. Primarily, this was the ability to edit PDF files “live”, within the tool itself. Additionally, the intent was to allow users to have their files fixed automatically, rather than manually. These objectives proved too time consuming and difficult in a limited project. Nonetheless, AccessBridge made many significant improvements to benefit the users.

Fundamentally, users need a simple and effective way to fix accessibility issues within the files that they upload. This includes a simple and easy UI, easy step-by-step instructions, and a relatively quick and accurate process, with minimal errors. Explain what differentiates your product from others or the key aspects that make your product better.

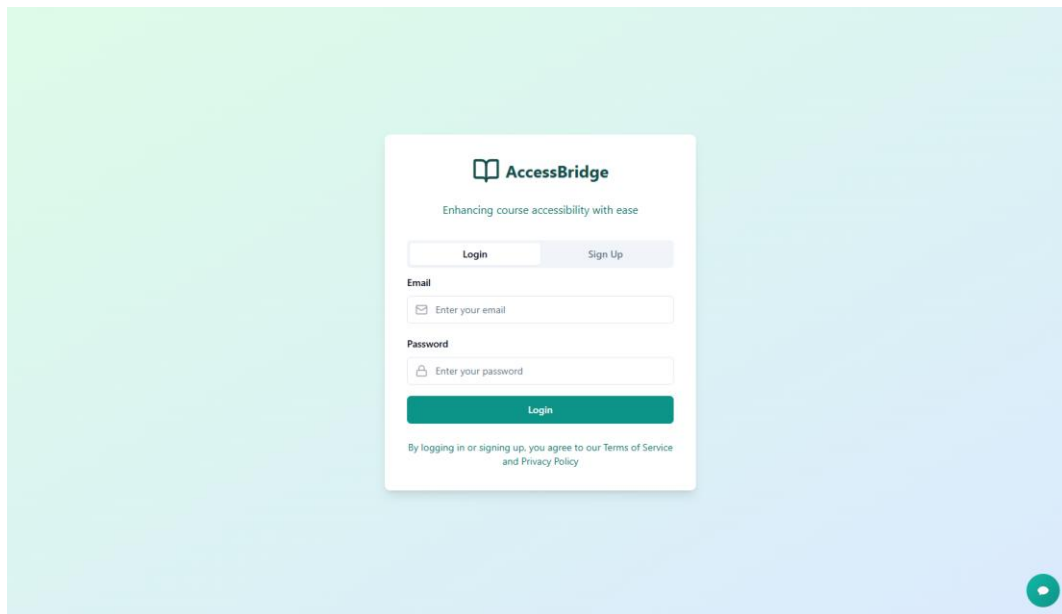


Figure 1: Login/Sign up page.

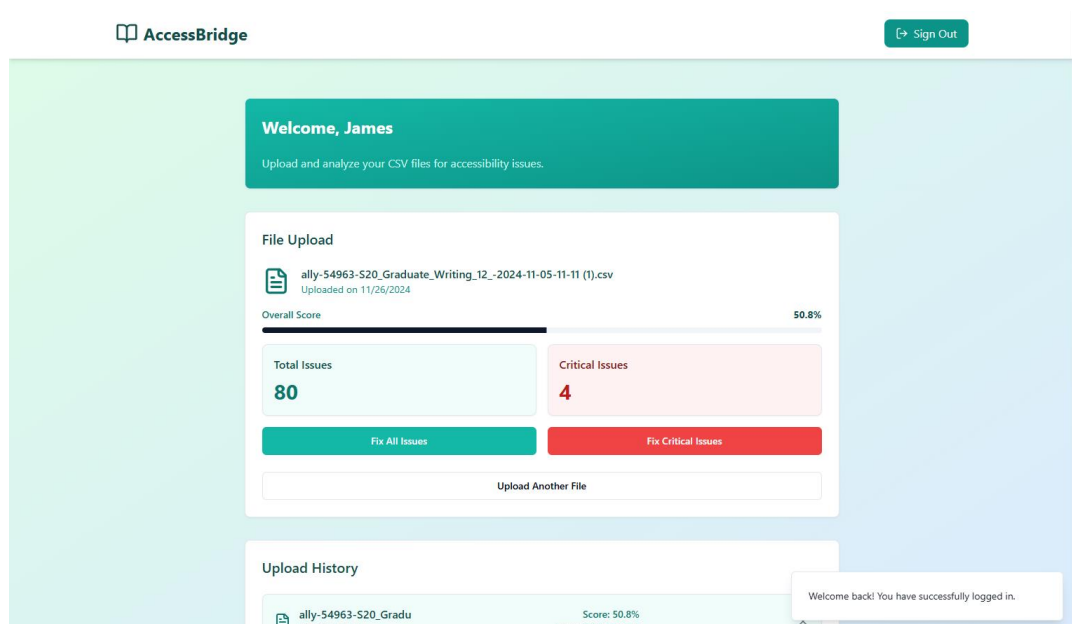


Figure 2: File Upload Interface.

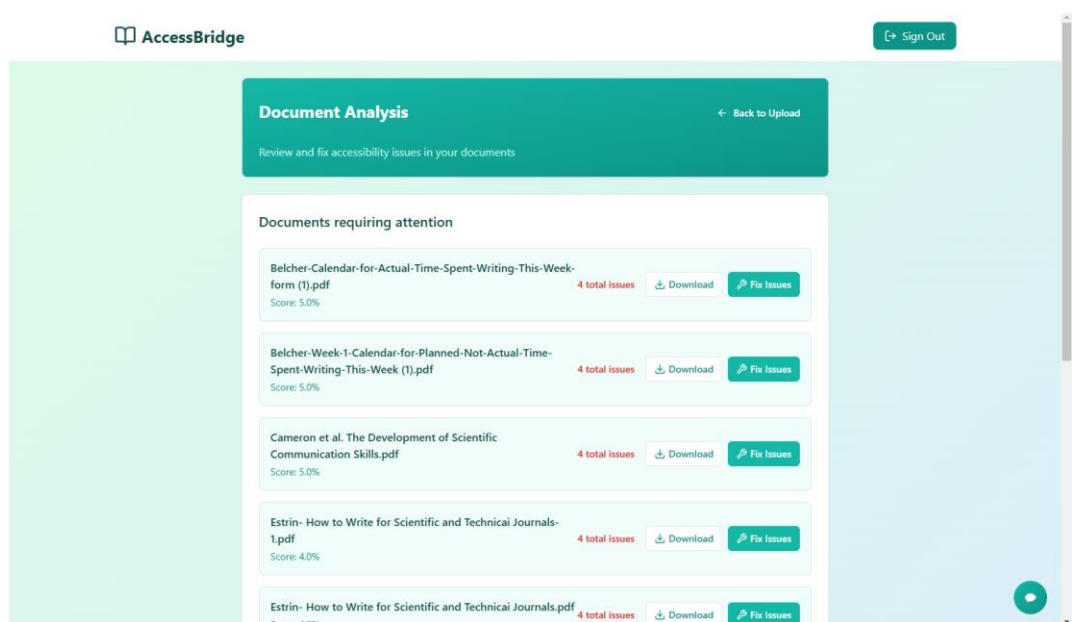


Figure 3: File Analysis Interface.

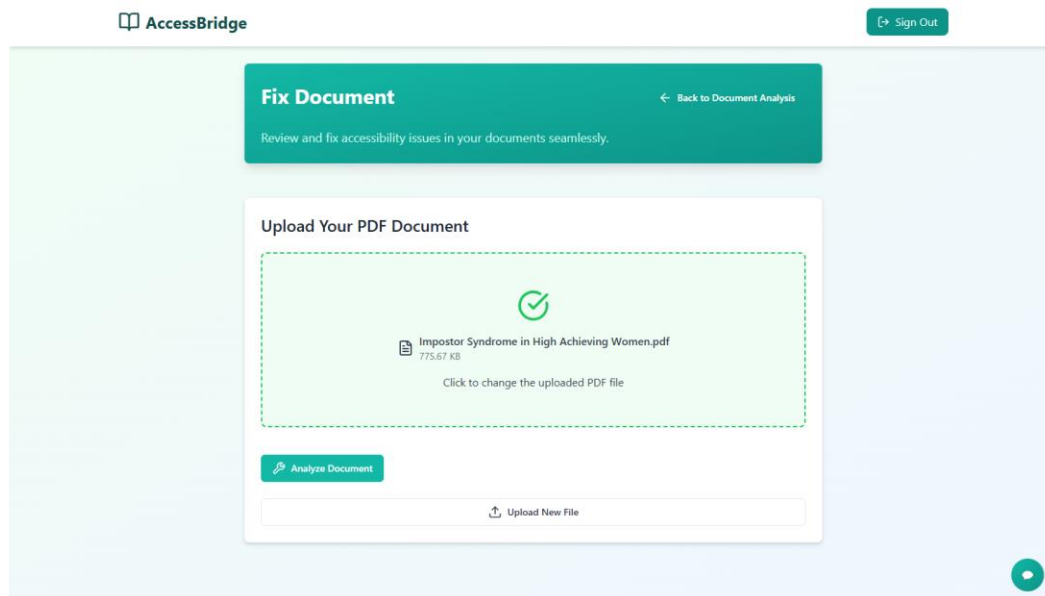


Figure 4: PDF Upload Interface.

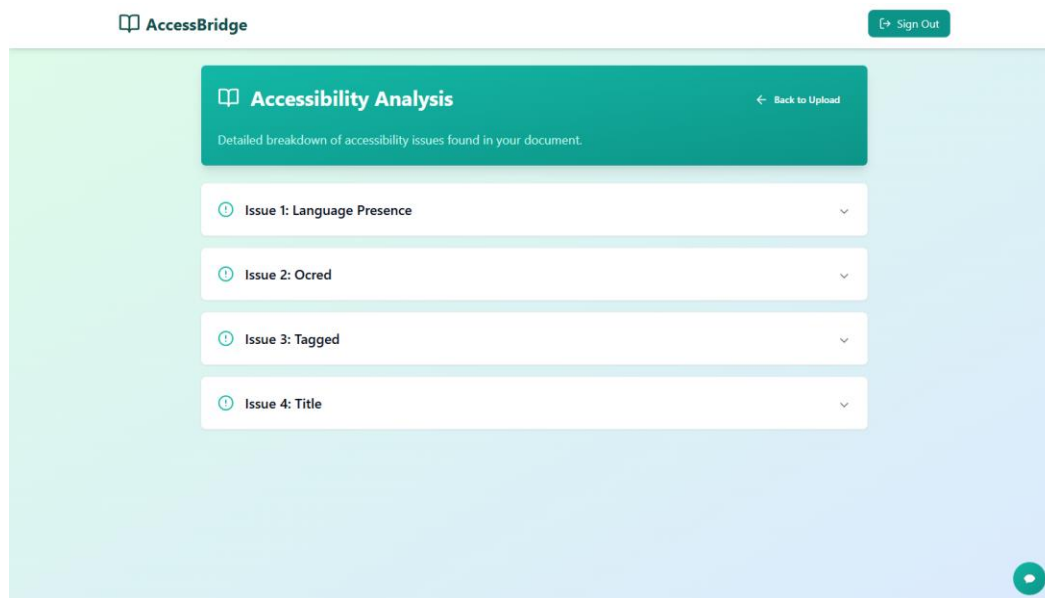
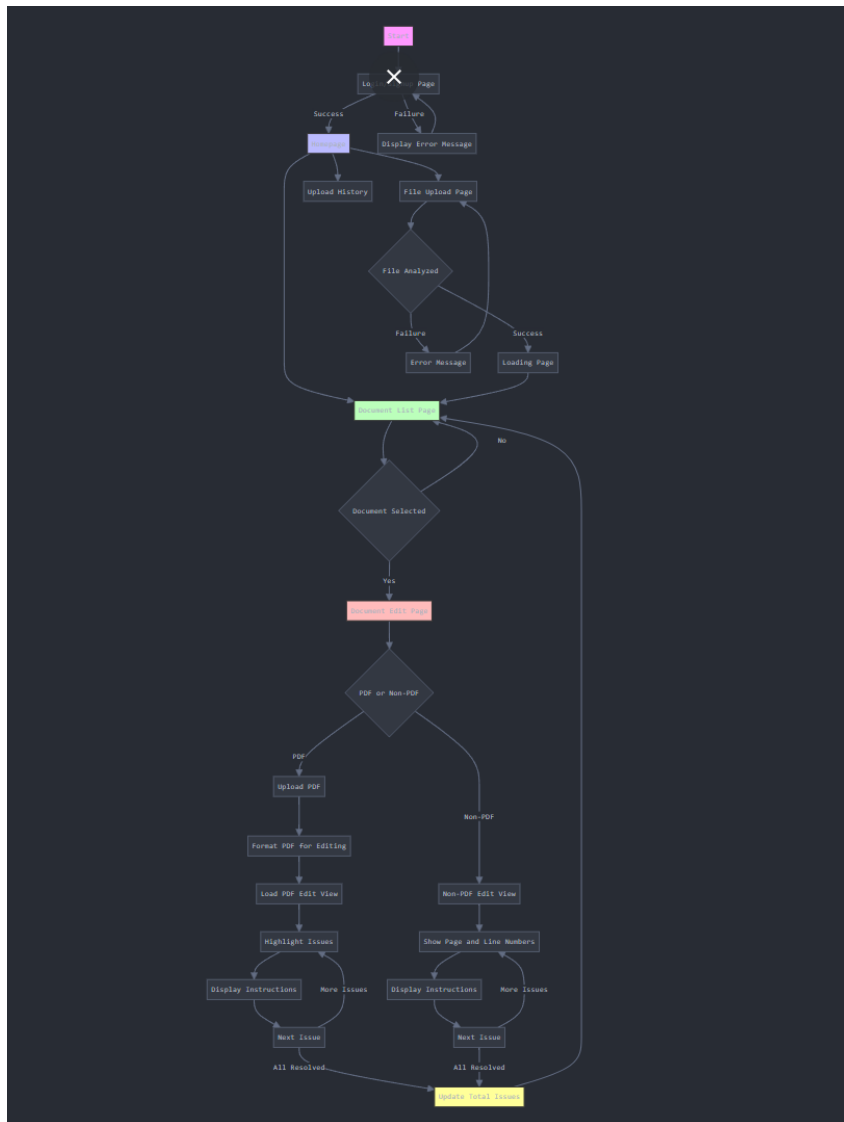


Figure 5: Accessibility Analysis Interface (issues with fixes).

The first key features a user will encounter in AccessBridge is the login and signup page. Here, users will login using their credentials or create a login with their email address, password protected. The next key feature is the file upload page. Here, users will upload their .CSV file which corresponds to the files submitted in Blackboard Ally. AccessBridge will scan the files and give an output of each file in the .CSV. From here, Users will notice another key feature, the PDF upload interface. Here users can upload each PDF file mentioned in the File Analysis Interface (see figure 3), individually, and select “analyze document”. Finally, users will move onto the last page, where they can see each issue within the PDFs and how to fix them. Other key features include the Chatbot window in the bottom of the Accessibility Analysis page, as well as the sign-out feature (available at all stages).



2. Conventions

The User Manual is written with standard text with no ambiguous conventions or syntax. However, this document contains a fair amount of technical language which may be confusing. If you encounter terms or acronyms that you do not know, consult the *List of Tables* above. If they are not listed, use an open-source dictionary or search the internet.

2.1 Cautions & Warnings

There are no major cautions or warnings associated with the use of this prototype, since it is a software tool. However, there are a few considerations the user should know before using AccessBridge. This tool will not fix your files for you. It is used as a better and easier way to help fix your files and courseware. The user will need to make changes to files and courseware on their own, based upon the instructions from AccessBridge. If the user follows all instructions correctly, the files will be in compliance with Web and Mobile Accessibility rules. Notwithstanding, AccessBridge assumes no liability for courseware that is *not* in compliance with these rules. Additionally, AccessBridge will require your email and a password to create and use an account, though these credentials will be stored safely within AccessBridge's using Firebase.

3 Getting started

This section is a complete guide to help you begin using the LMS Accessibility Tool effectively.

By following these steps, you will be able to use all the features, even if you aren't very experienced with technology. The tool is specially designed for teachers and school administrators to make course materials easier for everyone to access. It helps identify and fix accessibility problems so that all students have an equal opportunity to succeed. With this tool, you can quickly improve the accessibility of your content and make it better for all learners.

3.1 Set-Up

Considerations System Requirements

To make sure the LMS Accessibility Tool works well, it's important to check that your device meets the requirements listed below. Meeting these requirements will help you avoid slowdowns or other problems when using the tool. Here's what you need:

Operating System:

Windows: Windows 10 or later. If you have an older version, try to update it so that the tool runs smoothly without any issues. macOS: macOS Big Sur 11.0 or later. Make sure your macOS is up to date so that you can use all the features and avoid compatibility problems. Linux: Ubuntu 20.04 or later. If you are using Linux, this version or later is the best to use to make sure everything works properly.

Internet Browser (latest versions recommended):

Google Chrome: Chrome works well with the LMS Accessibility Tool, providing good speed and stability. Always use the latest version for the best experience.

Microsoft Edge: Edge is another browser that works well with this tool.

Hardware:

Processor: Dual-Core Intel i5 or higher. A good processor will help the tool run smoothly without delays.

RAM: At least 4 GB, though 8 GB is recommended. More memory helps the tool work faster, especially if you have multiple tabs or files open at the same time.

Storage: At least 200 MB of free space for browser cache and temporary files. This is needed so that the tool runs without any hiccups.

Network: A stable internet connection with at least 5 Mbps speed. A steady connection will make sure your uploads and analyses happen smoothly and without interruptions.

Access to the LMS Accessibility Tool

Make sure you have an active account to use the tool. If you're a new user, go to Section 3.3 for instructions on how to sign up.

Supported File Formats

The LMS Accessibility Tool works with specific file types to help make content more accessible. Here are the types of files you can use:

Ally-generated CSV files: These files have information about the accessibility of your course content. They help you see which parts need improvement and show where accessibility problems exist.

PDF files: The tool also works with PDF files, allowing you to identify and directly fix accessibility issues. This makes it easy to improve the quality of your documents and ensure they are accessible for everyone.

3.2 User Access Considerations

Upload Ally CSV reports:

Educators can upload reports that show which parts of their course content need improvements in accessibility.

Check accessibility issues in course materials: Educators can see detailed information about what problems exist and get guidance on how to fix them.

Account Security: Your account is protected using Firebase, which helps to manage user logins securely. To keep your account safe when using the LMS Accessibility Tool, be sure to follow these steps:

Use a strong, unique password: Make sure your password has at least 8 characters and includes numbers, special symbols, and uppercase letters. Never use the same password across multiple

sites. If you have trouble logging in, check the troubleshooting section in Chapter 5. It has helpful tips to solve common login issues and make sure your account stays secure.

3.3 Accessing the System Registration and Login

Step 1: Registering an Account

To start using the LMS Accessibility Tool, you first need to create an account. Follow these simple steps to register:

Go to the LMS Accessibility Tool homepage

Click on Sign Up on the welcome page. You will see a form that asks for your details.

Fill out the registration form:

Name: Enter your first and last name so that the system can identify you.

Email Address: Enter a valid email address. This email will be used for logging in and for receiving notifications or updates.

Password: Create a strong password (at least 6 characters with uppercase letters, numbers, and special characters). A strong password helps keep your account safe.

Review and accept the Terms of Service and Privacy Policy: Make sure to read these policies so that you understand your rights and responsibilities when using the tool. Click Register. You will be taken to the login page where you can start using the LMS Accessibility Tool.

Step 2: Logging In

Once you have successfully registered, you can log in by following these steps:

Go to the login page and enter your email address and password. Click Log In. If the details are correct, you will be taken to your dashboard where you can start using the LMS Accessibility Tool.

Uploading and Managing Files

The LMS Accessibility Tool is designed to make uploading and analyzing files for accessibility simple and straightforward. Follow these steps to get started:

Step 1: Upload a File

After logging in, go to the File Upload section on your dashboard. It is easy to find and clearly marked.

Click Upload: Use this button to start uploading your CSV report. Drag and drop your CSV file into the upload area or click Browse to choose a file from your device. You will see a progress bar as the file uploads. After the file is uploaded, click Analyze. The tool will then process the report and display the results on the Analysis Dashboard. This analysis will provide you with a clear overview of any accessibility issues found.

Step 2: Manage Uploaded Files

To keep track of your uploaded files, go to the Upload History tab. This section shows all the files you have analyzed in the past.

Each file entry includes:

Date of upload: This helps you remember when each report was uploaded.

Total number of issues: Shows how many problems were found in each report.

Number of critical issues: Highlights which issues need to be addressed first.

3.4 System Organization & Navigation

Overview of the User Interface

The LMS Accessibility Tool interface is simple to use and is organized into several main sections. Here is an overview of the key areas you will be working with:

Dashboard Purpose: The dashboard is the main hub where users start. It helps you easily find and access important features.

Features: Upload new files: Use this feature to upload Ally CSV or PDF files for analysis.

Analysis Dashboard The Analysis Dashboard provides detailed information for each file you upload:

Total Issues: The total number of accessibility problems found in the file.

Critical Issues: The most serious problems that should be fixed right away.

Accessibility Score: A percentage that shows how accessible the file is. The higher the score, the better the accessibility.

File Details Page

For each file you analyze, you can:

See a breakdown of each issue: The tool lists each problem, where it is located, and why it matters.

Get step-by-step instructions to fix problems: The tool provides easy-to-follow instructions to help you solve each problem.

Chatbot Assistant: In the bottom-right corner of every page, you will find the Chatbot Assistant. The Chatbot can help you with:

Answers to common questions: Learn more about accessibility and why it is important for your course materials.

Step-by-step help: If you are stuck, the Chatbot can guide you through the steps.

Links to extra resources: The Chatbot can also direct you to more guides or articles to help you understand and solve accessibility issues.

3.5 Exiting the System

It is important to exit the LMS Accessibility Tool properly to make sure your work is saved and that your account remains secure.

Logging Out: When you are ready to stop using the LMS Accessibility Tool, follow these steps to log out safely:

Click the Sign Out button in the top-right corner of the page. This will end your session. Make sure you see the confirmation message: "You have successfully logged out." This ensures that you have logged off successfully.

3.6 Saving Progress

The LMS Accessibility Tool automatically saves your progress after you analyze files, but it is always a good idea to:

Finish any tasks before logging out: Completing your work makes sure that everything is properly saved.

Check the Upload History section regularly to make sure your files and analyses are stored: This helps you keep track of all your past activities and ensure that nothing is missing. Keeping an eye on this section will also help you make sure everything is up to date and accessible to students.

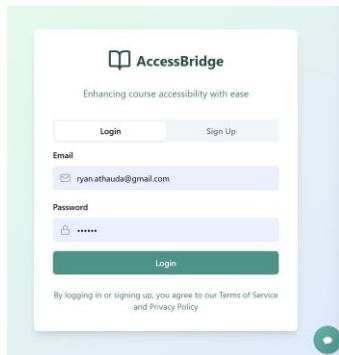
4 Using the System

In using the system, various features are present to optimize user experience and efficiency, as well as ensure security. The key features present are the authentication page, CSV file uploading, the document list, PDF analysis, the solutions page, and chatbot support.

4.1 Authentication

The authentication page allows users to sign into or create an account, which is crucial for other key features of AccessBridge. Individual accounts allow users to access their upload history and save steps for amendments required on their course documents.

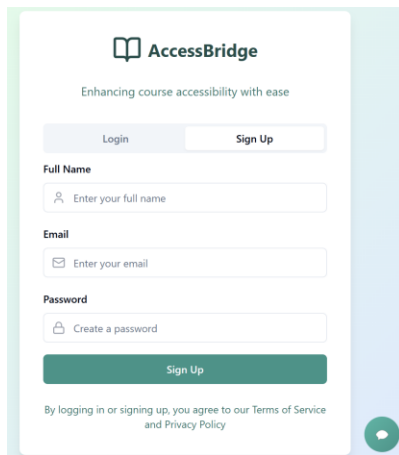
4.1.1 Login



The login screen consists of two text boxes for users with existing accounts. The first text box, labeled as “Email”, is for users to enter the email associated with their account. The second text box, labeled “Password”, is for users to enter the password associated with their account. All characters entered into the password text box are hidden by default, for added security. Once the email and password associated with an account is entered, the user can click on the button below the password text box, labeled as “Login” to access the home page of Accessbridge.

4.1.2 Sign Up

The sign up screen is comprised of three text boxes. The first text box, labeled “Full Name”, is for users to enter the name they wish to be associated with their AccessBridge account. The second text



AccessBridge
Enhancing course accessibility with ease

Login Sign Up

Full Name
Enter your full name

Email
Enter your email

Password
Create a password

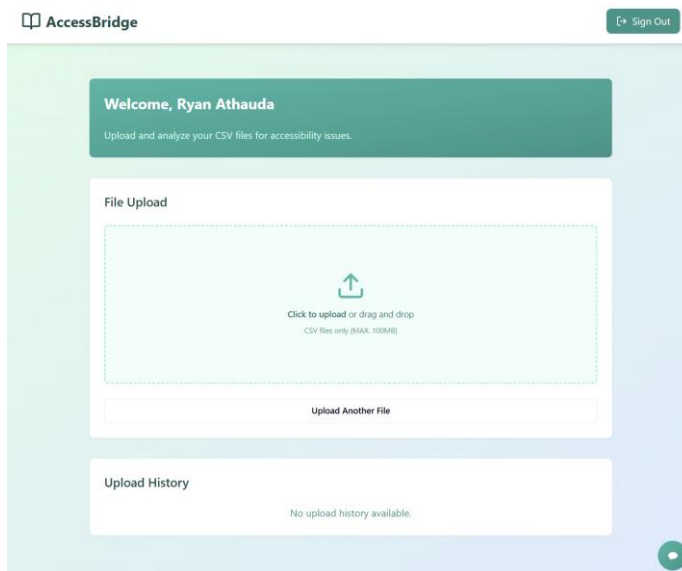
Sign Up

By logging in or signing up, you agree to our Terms of Service and Privacy Policy

box, labeled “Email”, is for users to enter an email that will correspond to the account to be created. The entered email will be used to log in for returning users. The third text box, labeled “Password”, is for users to create a unique security password in order to access their account. The created password must be at least six characters in length. Once a full name, email, and valid password have been entered, the user can click on the button

labeled “Sign Up” to finish the account creation process.

4.2 Home Page



AccessBridge Sign Out

Welcome, Ryan Athauda
Upload and analyze your CSV files for accessibility issues.

File Upload

Click to upload or drag and drop
CSV files only (MAX. 100MB)

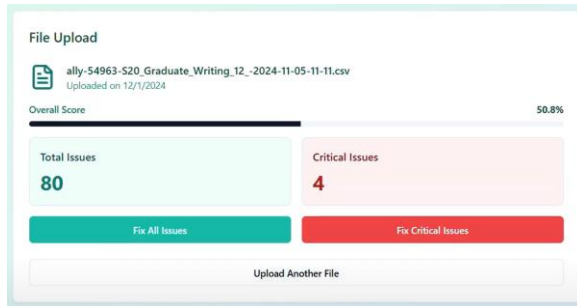
Upload Another File

Upload History
No upload history available.

The home page of Accessbridge consists of multiple sub-features, such as the file upload, upload history, and chatbot support. The home page consists of a banner welcoming users, a sign out button on the upper right corner, a file upload box, an upload history box, and a button with a message icon on the lower right corner to

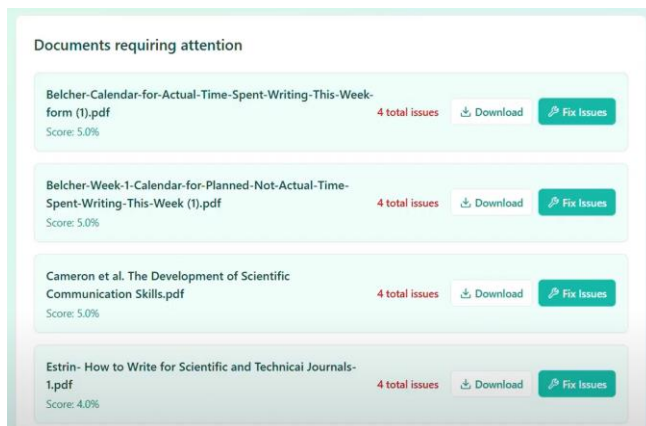
enable chatbot support. If the sign out button is clicked, users will be returned to the authentication page.

4.2.1 File Upload



The file upload box can be clicked to access the device file manager, or files can be dragged and dropped into the upload box. Note that only CSV files within the accepted file size values (as listed on the file upload box) will be accepted. Underneath

the upload box is a hyperlink to the Ally website with instructions on how to obtain a CSV file.



Once a file is uploaded, an overall accessibility score is displayed, as well as a value for total issues and a value for critical issues. Three buttons are also available for the user to click, one labeled “Fix All Issues”, one labeled “Fix Critical Issues”, and one labeled “Upload

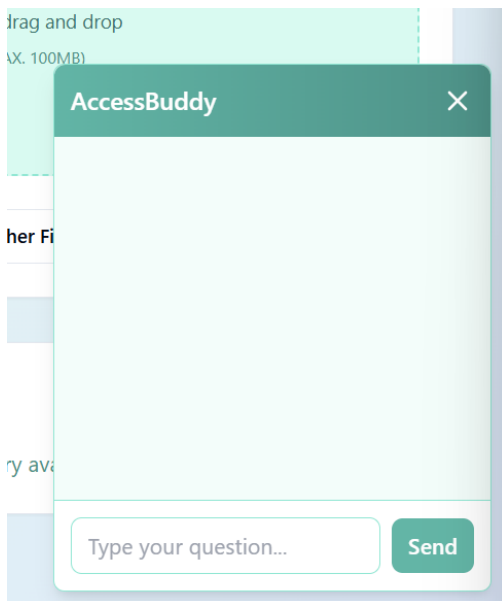
Another File”. If the button to upload another file is clicked, the user will be able to upload another CSV file to the upload box. If the button to fix all issues is clicked, the user will be able to see a list of all documents requiring attention. If the button to fix only critical issues is clicked, the user will be able to see a list of documents requiring attention with critical accessibility issues. In the list of documents requiring attention, two buttons are displayed next to each document. The button labeled “Download” allows the user to download the file from the Canvas website. The button labeled “Fix Issues” allows the user to access the PDF analysis page for the specific document.

4.2.2 Upload History

The upload history section of the home page consists of a list of previously uploaded CSV files, along with their respective accessibility scores, issues present, and critical issues present. If clicked, the user will be taken to the “Documents Requiring Attention” page for the respective CSV file.



4.2.3 Chatbot Support (AccessBuddy)



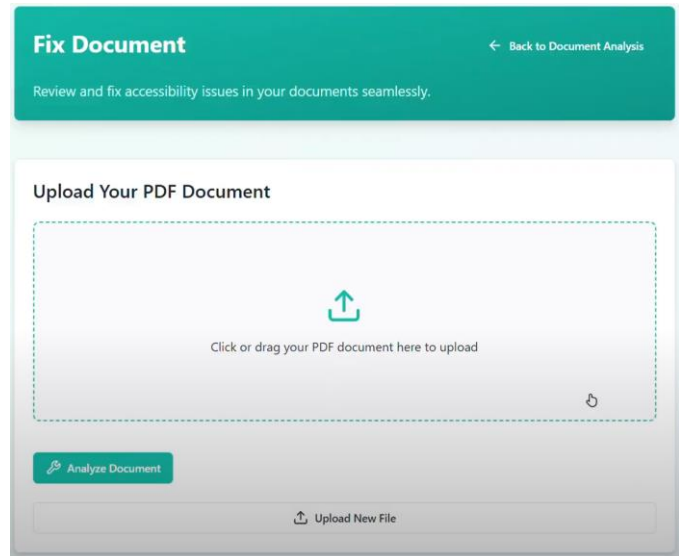
AccessBuddy, the chatbot available for automated support responses, can be accessed on any page of AccessBridge. To access the chatbot, the user must click the circular button with a text bubble icon on the lower right corner of the page. Once clicked, a small window appears on the lower right corner of the page with a text box labeled “Type your question...”, a button labeled “Send”, and a “X” button on the top right corner of the window to close the AccessBuddy window. Once the user

types a question and clicks on the send button, AccessBuddy will provide an automated response to assist the user.

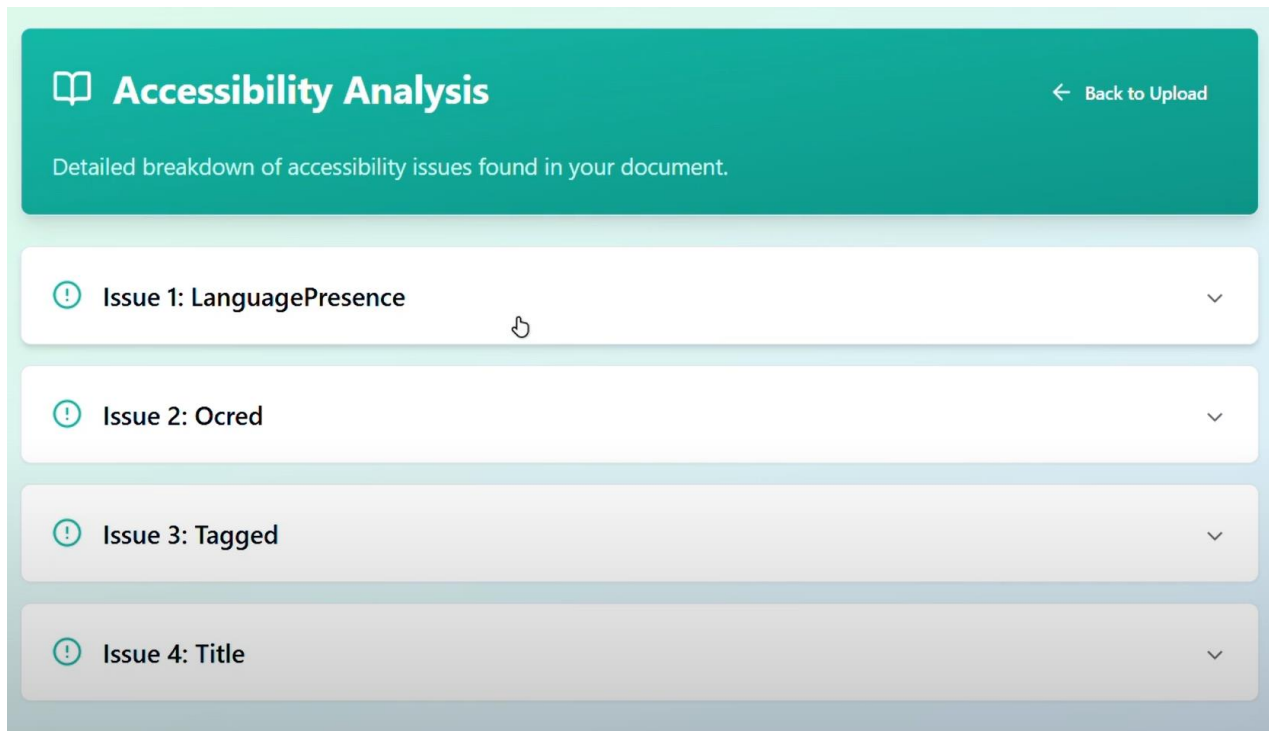
4.3 PDF Analysis

On the PDF analysis page, the user can upload the PDF document requiring accessibility alterations. Similar to the CSV file upload box, the user can choose to drag a file over the PDF analysis box or click the box to access the device file manager. Once a file is uploaded, the user must click the button labeled “Analyze Document” to begin

the PDF analysis process. A progress bar shows the progress for the PDF analysis, and once the analysis is completed, the user is shown the accessibility analysis page.



4.3.1 Accessibility Analysis



The accessibility analysis page showcases the specific accessibility issues within a document, and has a list of drop-down bars displayed simple, step-by-step instructions on how to fix present accessibility issues. Once the user clicks on a drop-down bar corresponding to a specific issue, the steps to fix the issue are displayed. On the banner at the top of the accessibility analysis page, there is a button labeled “Back to Upload”, which when clicked will return the user to the upload page for the PDF analysis.

4.4 Troubleshooting & Support Error Messages or Behaviors

If you encounter any error messages or unexpected behaviors while using AccessBridge, follow these steps:

1. **Check the Console Logs:** Access the console log files located in the application directory.

These logs contain detailed error information that can help diagnose the issue.

2. **Common Errors:**

- a. **"File Upload Failed":** Ensure the file format is supported (e.g., PDF for analysis).

Double-check your internet connection.

- b. **"Analysis Timed Out":** Check the console log and ensure the headings with issues for the file is displayed. If it is not display go back to the document list page and select your document again. If the issue persist, try uploading another csv file. If that does not solve the issue, the PDF file may be too large. Try analyzing smaller sections or contact support for assistance.

3. **Restart the Application:** Restarting can resolve temporary issues caused by resource conflicts.

4. **Update Software:** Ensure you are using the latest version of AccessBridge. Updates often include fixes for known bugs.

If the issue persists, proceed to the Support section.

4.5 Special Considerations

AccessBridge is designed to comply with accessibility guidelines. However, specific setups may require additional steps:

- **Browser Compatibility:** Ensure that you are using a supported browser (e.g., Chrome, Edge).
- **File Format Requirements:** PDF files must follow standard encoding to be processed correctly. Non-standard files may not yield accurate results.
- **Firewall Restrictions:** Corporate or institutional firewalls may block the application's API calls. Coordinate with your IT department to whitelist AccessBridge's endpoints.

For further details on these considerations, consult the FAQ section on our website.

4.6 Maintenance

To ensure optimal performance, perform regular maintenance:

1. **Clear Cache:** Periodically clear application cache to avoid slowdowns.
2. **Check for Updates:** Enable automatic updates to receive the latest features and bug fixes.
3. **Backup Data:** Use the export feature to save your analysis reports securely.

Refer to the Maintenance Guide for step-by-step instructions.

4.7 Support

If troubleshooting steps do not resolve the issue, contact our support team:

- **Email:** agohar@uottawa.ca

When reaching out for help, provide the following details:

- A brief description of the issue.
- Steps to reproduce the problem.
- Screenshots or error logs (if applicable).
-

Our support team will try our best to get back to you within 36 hours.

5 Product Documentation

5.1 Login/Signup

The login function utilizes Firebase authentication to store user data tied with their login details. This is used primarily to store the user's upload history of documents and .csv files to compare new versions with previous ones and allow the user to easily discern their progress and the impact the changes they've made have had on their materials' accessibility score.

5.2 CSV File Upload & Analysis

The .csv file is uploaded to the system and converted to a list of documents and their respective accessibility issues.

5.3 Document Download

The .csv file includes a URL to each document's location within canvas, which is assigned to a button in the website's UI, allowing the user to quickly download them directly to their computer for editing.

5.4 Document Scanning + Instructions

Once the user has downloaded the document file from the canvas course, they can upload it back into the website for analysis. This process is performed by prompting ChatGPT 4o to search for accessibility issues within the given document, specifically the issues already listed in the .csv file, then generate instructions on how to fix them. Narrowing down this prompt allows the results to be more focused and reduces the risk of hallucination.

5.5 BOM (Bill of Materials)

Item No.	Name of application	Description	Cost (CAD)	Quantity	Total Cost (CAD)
1	Rutgers NetID	Guest access account to Rutgers Canvas platform	\$0.00	1	
2	Visual Studio Code	Code editor for web applications, used as an IDE	\$0.00	5	
3	Node.js	JavaScript runtime environment	\$0.00	5	
4	Git	DevOps tool used for source code management.	\$0.00	5	
5	Firebase	Used for account authentication & storage of account IDs	\$0.00	1	
					\$0.00

5.6 Equipment list

Name	Skill or Resource	Description
Redux	Resource	used to store user data
Firebase	Resource	For authentication and Firestore database
Papa Parse	Resource	For handling CSV file parsing and extracting data
React	Resource	For creating interactive components

Back End Design	Skill	Implementation of various back-end software. Relies on programming
Front End Design	Skill	User Interface. Overall aesthetics and website layout.

5.7 Testing & Validation

Our testing focused on the quality of the results provided by ChatGPT's analysis and the instructions it generated based on our prompts, the website's interface and user experience, and the technical performance of our website. A summary of the elements tested can be found below:

#	Metric	Units	AccessBridge	Target Specifications
1	How clear the instructions are	Fallback Rate (%)	10	<10
2	How well the important changes are shown first	Response Accuracy Rate (%)	90	>85
3	How helpful the answers are	Fallback Rate (%)	10	<10
4	How easy it is to use	Time On Task (Minutes)	<1	<20
5	Does it do what it is said to do	Conversion Rate (%)	90	>75
6	How accurately it reads the file	Error Detection Rate (%)	95	>90
7	How much space chatbot uses on the screen	Percentage of Space used by chatbot relative to screen (%)	21	20-25
8	How many different web browsers does it work on	Number of supported browsers (No units)	>3	>3

Testing was performed in an experimental manner, through stress testing the product's technical limitations and through allowing users unfamiliar with our website. This way we could determine the characteristics shown above, all of which met or exceeded our target specifications

6 Conclusions and Recommendations for Future Work

Over the course of the development timeline for AccessBridge, many lessons were learned and much valuable insight was gained. The crucial takeaways were the importance of early user feedback, the efficiency of iterative prototyping, and the significance of proper delegation within the development group. Early client feedback served a large role in making the product user-friendly and compatible with Ally, an existing tool for the users. The iterative prototyping model allowed the group to improve upon the prototype and create a more suitable product in a step-wise fashion. Moreover, efficient delegation of group tasks allowed group members to contribute to the project in a manner that was tailored to their individual strengths, allowing the group to create the best product possible with their skillsets in the time frame provided. As such, it is recommended that groups undertaking similar projects employ the iterative prototyping model.

Some features were not able to be implemented due to time constraints imposed. The main feature is chatbot training for AccessBuddy, which would allow the chatbot to provide responses specific to the site to better help users navigate the site. Additional security and authentication features would also be imposed, such as two factor authentication, the ability to recover passwords, and security updates as required. Adjustable website settings are also a goal for the AccessBridge team going forward. The main area of focus for the AccessBridge team is maintenance, as the website requires occasional maintenance in the form of functional updates, security updates, and bug fixes to be proficient and sustainable.

1 Bibliography

7 APPENDICES

8 APPENDIX I: Design Files

Related documents include several project deliverables, including PD-(B-D) and (E-H).

[PD-\(B-D\)](#)

[PD-\(E-I\)](#)

<https://makerepo.com/acotn068/2224.lmsaccessibilitytool>

Table 3. Referenced Documents

Document Name	Document Location and/or URL	Issuance Date
PD-(B-D)	https://uottawa-my.sharepoint.com/:w:/r/personal/acotn068_uottawa_ca/_layouts/15/Doc.aspx?sourcedoc=%7B569C1219-156C-4309-B7AC-9E12D0DAA8DF%7D&file=PD_B-D_Template-f24%20-%20Team%203.4.docx&action=default&mobileredirect=true&DefaultItemOpen=1&ct=1733357835556&wdOrigin=OFFICECOM-WEB.MAIN.EDGEWORTH&cid=19ca5de0-846c-41f4-bc4c-ec84c0686b03&wdPreviousSessionSrc=HarmonyWeb&wdPreviousSession=3c42fea4-b252-46e4-9dad-54b14f6d0f01	9/18/2024
PD-(E-I)	https://uottawa-my.sharepoint.com/:w:/r/personal/acotn068_uottawa_ca/_layouts/15/Doc.aspx?sourcedoc=%7BF19CAFFC-6B9B-4052-A9DB-FA3198C0121A%7D&file=PD_E-I%20Group%203.4-f24%20(1).docx&action=default&mobileredirect=true&DefaultItemOpen=1&ct=1733357785560&wdOrigin=OFFICECOM-WEB.MAIN.EDGEWORTH&cid=80bb2be2-94b2-432c-b5e1-39cb6b4686c1&wdPreviousSessionSrc=HarmonyWeb&wdPreviousSession=3c42fea4-b252-46e4-9dad-54b14f6d0f01	10/21/2024

9 APPENDIX II: Other Appendices